

# Philosophy of Physics Part III Physics Lectures

## Lecture 1: Reciprocal constraints of Physics & Philosophy

2. The two cultures - objective v. Subjective.
3. 1st debt book (negative pages)
4. 2nd debt activity - Mersenne v. Mersenne
5. What is physics - Natural sciences  
 & phenomena matter & space deployed  
 through space & time - Theory derivation - Unification
6. What is Philosophy: credit holes & its  
 cognitive enterprise - speculation & justification  
 analysis Effectiveness
7. Q.E.D. example
8. On Physics lecture in Q.E.D.  
 of classical mechanics core  
 problems a) QM b) renormalization c)  
 and how of objective parameters
9. Hol. Guide of TDE
10. Quant. Confusion
11. Deon. - Evidence of Observation
12. Philosophy now:  
 Frequentism, Empiricism v. rationalism,  
 Positivism, Pragmatism, Realism, Relativism, Postmodernism
13. Englishist problem - Extremes: relativism, Realism
14. Problem - Empiricism & realism
15. Difficulties with Realism:  
 (a) Undeterminism  
 (b) Local d. Convergence  
 (c) Very multiple  
 (d) Further structure

## Lecture 2 1. The view from nature

2. Primary and secondary qualities
3. Relations at the observer - relative relations
4. Relative relations are real - shadow example
5. Statistical mechanics - subjected approach to Entropy.
6. Cylinder expansion:  $\Delta S = k \ln \frac{V_f}{V_i}$   
equation with  $\int \frac{dQ}{T}$  in small isothermal expansion.
7. Statistical mechanics  $S = -k \sum_{n=1}^W p_n \ln p_n$   
Put  $p_n = \frac{1}{W} \Rightarrow S = k \ln W$  - Boltzmann - Planck.
8. Coarse graining and irreversibility
9. QM mechanics - observables, exp. averages
10. QM measurement theory - S. Cat.  
- role of consciousness
11. Anthropic Principle, weak > strong version



# Lecture 3

1. Realism & antirealism in QM. (hr versus Bohr)
2. What is value of  $\psi$  also not in an eigenstate?
3. Superimposed metaphysics
3. Realism solves the measurement problem and is proved by the EPR argument (1935)
4. But Bell (1964) shows  $R \rightarrow B.I.$  refuted by prediction of QM and by exp! (1982) Aspect (1984)
5. But also  $\psi \rightarrow A \rightarrow \sim LRA$ ?  
Show Transference in EPR  
Then summary: Measurement & QM Transference
6. Kocher-Speiser paradox
7. Heywood-Predicament
8. OLOC & ELOC.
9. Lewis et al. of a Unlocal hand.
10. Part-whole reductions
11. classical flow-state
12. Hilbert space - Quantum Entanglement
13. Role of OLOC in Mermin's proof of Bell's & Particularism.
14. Reductive hierarchy  $EPR \rightarrow \psi \rightarrow \text{class} \rightarrow \text{Red}$
15.  $\rightarrow$  Social Science  
My class of

## Lecture 4

1. Hawking 1980 'Inward Bound', 'Is the End in Sight for Theoretical Physics?'
2. Kellogg - most discussed place
3. of inflation of globe
4. Born 'Physics will be as in 6 months' return to Dirac Eq. 1927.
5.  $N=8$  extended supersymmetry (Hachis)
6. → Sheng Sheng  
Coined a TOE causal symmetry: D.N. model of expansion
7. But indeterminism: Cannot explain why we are here. initial boundary conditions may not be contingent - of indeterminism - Difficult of producing one theory in physics.
8. Bookshop physics
9. Superficial aspect of physics - explain chemistry, biology, even psychology.
10. In principle v. 'in practice' reduction.
11. Physics itself may be just a patchwork - of causality.
12. Chinese losses v. TOE  
of affected field theory v. string theory
13. Popperian image of peer-to-peer - established response of colleagues  
ideal (cf Kant) - even if it does not exist  
of Atomism programme.  
TOE is a speculative
14. Are we getting nearer to a picture - Physics is  
second  
P.R.



15. Techniques yes, structural seems too far

16. Incommensurability - Diachronic relations  
between them - 26 Cosmology

17. Properly 1-2 km - 26  
Cosmological limits,  $1/10 \rightarrow 0$ ,  $t \rightarrow 0$ , etc

18. Shows 3 types of behavior

19. Logical limits, ex. use ex.  $\mu \rightarrow 0$   $\left( \begin{matrix} -1/10 \\ -1/10 \\ -1/10 \end{matrix} \right)$

20. v-p space - multidimensional

v - dimensions

distances

Show Transitions  
of approach to TUE

distances  
properly

grav.  
10<sup>29</sup>

power of

21. Part: Remedy of distant proposition.  
(of Prologos) "Every" some good  
lead to a new question.

22. Properly Conductor - densely dense  
- Ruler degree  
of  $10^{-16}$  cm (100 GeV)  $10^{-29}$  cm  
Planck length  $10^{-33}$  cm ( $10^{21}$  GeV) ( $10^{17}$  GeV)

23. Dangers of Question

24. Resolution - Gold's version.

25. Explanation of Actions of a TUE.

26. Introduction of Physics, philosophy.